

Discharge Source for SMI Experiments in Early 2023

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Why?

- ✦ Laser ionization does not scale to long plasma lengths
 - ✦ Energy depletion, focusing geometry
- ✦ $\sim 100\text{GeV}$, $\sim 1\text{GeV/m} \Rightarrow \sim 100\text{m}$ plasma
- ✦ Need scalable plasma source
 - ✦ SM acceleration requires $\Delta n_e/n_{e0} \sim 0.2\%$

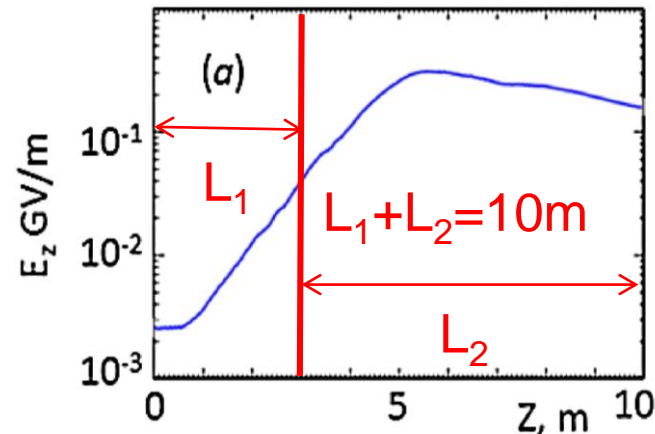


Why now?

- ✦ Motivation, it may take some time to get there ...
- ✦ Integration
 - ✦ Source itself (Nelson, Alban)
 - ✦ Vacuum interface with static fill (e-bunch)
- ✦ Natural time between two vapor sources
 - ✦ "Simpler" system



Pukhov, PRL107 145003 (2011)



Physics?

- ✦ Vary the plasma length: 5+5, 3+7?
- ✦ Ion motion: heavy Ar, light He, H_2
- ✦ Plasma light diagnostic?
- ✦ No laser, no e-beam (only SMI experiments)